

**What is claimed is:**

1. A method for determining the activity of a cell cycle regulatory factor comprising the steps of:
  - preparing a sample for measuring a cyclin-dependent kinase/cyclin complex from living cells;
  - reacting adenosine 5'-O-(3-thiotriphosphate) (ATP- $\gamma$  S) with a substrate for the cyclin-dependent kinase in presence of the sample in order to introduce a monothiophosphate group into a serine or threonine residue of the substrate;
- 10 labeling the substrate by coupling a labeling fluorophore or a labeling enzyme with a sulfur atom of the introduced monothiophosphate group;
  - measuring the amount of fluorescence from the labeling fluorophore labeling the substrate, or reacting the labeling enzyme labeling the substrate with a substance which generates an optically detectable product by reaction with the labeling enzyme and optically measuring the amount of the generated product; and
  - 15 calculating the activity of the cyclin-dependent kinase from the measured amount of fluorescence or the measured amount of the generated product with reference to a pre-produced reference curve.
2. The method according to claim 1, wherein the cyclin-dependent kinase of the complex is selected from the group consisting of CDK1, CDK2, CDK4 and CDK6.

3. The method according to claim 1, wherein the labeling fluorophore is a fluorescent dye.
4. The method according to claim 3, wherein the fluorescent dye is FITC.
- 5 5. A method according to claim 1, wherein the labeling enzyme is peroxidase.
6. A method according to any one of claims 1 to 5, wherein the cyclin-dependent kinase of the complex is CDK1 or CDK2 and the substrate is histone H1.
- 10 7. A method according to any one of claims 1 to 5, wherein the cyclin-dependent kinase of the complex is CDK4 or CDK6 and the substrate is Rb whose cysteine residue is substituted by alanine.
8. A method of diagnosing a cancer based on a result obtained by determination according to a method as set forth in claim 1.
- 15 9. A method according to claim 8, wherein the cancer is stomach cancer, colon cancer, breast cancer, lung cancer, esophageal cancer, prostate cancer, hepatic cancer, kidney
- 20 cancer, bladder cancer, skin cancer, uterine cancer, cerebral tumor, osteosarcoma or myeloma.